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Ruggedized Portable Instrumentation Package for Marine Mammal Evoked Potential Hearing Measurements

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LONG-TERM GOALS

To develop and instrumentation package in order to examine the hearing of as many marine mammals and species as possible in order to develop an understanding of the normal hearing capabilities of marine mammals. To advance the technology for testing hearing in the laboratory and the field.

OBJECTIVES

To build a rugged field-ready portable battery-operated system to use to measure the hearing capabilities of marine mammals in the lab, on ships, on the beach or wherever we have the opportunity.

APPROACH

Assemble equipment into a field-ready system, test the system in the laboratory, improve it with use, deploy it to stranded animal and field situations as they become available and test the hearing of marine mammals.

WORK COMPLETED

This task is now complete. A field ready system has been built and has been tested and used. In the last year a paper on the system was published. Data from the system measuring the hearing of a stranded beaked whale and a stranded long finned pilot whalte are available and have been published. The system is ready and available for use on a daily basis.

Using the Ruggedized Portable Instrumentation Package on the Beach testing the hearing of a stranded dolphin

RESULTS

This ruggedized device for measuring the hearing of stranded cetaceans allows us to respond rapidly to measure the hearing of animals in captive situations, in stranded animal facilities and in the water in temporary pools.

IMPACT/APPLICATIONS

Of the 85 species of whales and dolphins, we have basic hearing measurements on only 17 species. Many of our audiograms come from a single animal. This equipment will greatly assist in gathering information on what marine mammals hear. If navy operations are stopped because of the effects of noise on whales, it is imperative that we have baseline information on marine mammal hearing.

RELATED PROJECTS

Basic Hearing and Echolocation Mechanisms of Marine Mammals: Measured Auditory Evoked Potential and Behavioral Experiments: Award Number: N00014-08-1-1160. Self-changing of animal hearing to mitigate the effects of loud sound: Award Number N00014-12-1-0212.

REFEREED PUBLICATIONS

Pacini, A.F., Nachtigall, P.E., Quintos, C., Schofield, D. Look, D.A., Levine, G. and Turner, J. (2011) Audiogram of a stranded Blainville's beaked whale (*Mesoplodon densirostris*) measured using auditory evoked potentials. *Jnl Exp Biol* 214, 2409-2415.

Pacini, A., Nachtigall, P.E. and Kloepper, L.K. **(2012)** Portable auditory evoked potential system to assess odontocete hearing. Popper, A. N. and Hawkins, A. eds. *Effects of Noise on Aquatic Life*. Springer Science+Business Media, LLC, New York. 225-227.